

tests conducted, or submit evidence that such tests have been conducted, by the Underwriters' Laboratories, the Factory Mutual Laboratories, or by a properly supervised and inspected test laboratory acceptable to the Commandant (G-MSE), relative to determining the lift, relieving pressure and vacuum, and flow capacity of a representative sample of the pressure-vacuum relief valve in each size for which approval is desired. Test reports including flow capacity curves must be submitted to the Commandant (G-MSE).

[56 FR 35827, July 29, 1991, as amended by CGD 95-072, 60 FR 50467, Sept. 29, 1995; CGD 96-041, 61 FR 50734, Sept. 27, 1996]

### Subpart 162.018—Safety Relief Valves, Liquefied Compressed Gas

#### § 162.018-1 Applicable specifications, and referenced material.

(a) There are no other specifications applicable to this subpart except as noted in this subpart.

(b) The following referenced material from industry standards of the issue in effect on the date safety relief valves are manufactured shall form a part of the regulations of this subpart (see §§ 2.75-17 through 2.75-19 of Subchapter A (Procedures Applicable to the Public) and Subpart 50.15 of Subchapter F (Marine Engineering) of this chapter):

(1) ASME (American Society of Mechanical Engineers) Code (see § 50.15-5 of subchapter F (Marine Engineering) of this chapter): The following paragraph from section VIII of the ASME Code:

(i) UG-131, flow rating of valves, see § 162.018-7(a).

(2) CGA (Compressed Gas Association) standard: The following standard of the Compressed Gas Association (see § 50.15-20(a) of Subchapter F (Marine Engineering) of this chapter):

(i) S-1.2.5.2, Flow test data for safety and relief valves for use on pressure vessels, see § 162.018-7(a).

(c) A copy of this specification and the referenced material listed in this section, if used, shall be kept on file by the manufacturer, together with the approved plans, specifications, and cer-

tificate of approval. It is the manufacturer's responsibility to have the latest issue, including addenda and changes, of the referenced material on hand when manufacturing equipment under this subpart.

(1) The ASME Code may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, N.Y. 10017.

(2) The CGA standard may be obtained from the Compressed Gas Association, 500 Fifth Avenue, New York, N.Y. 10036.

[CGFR 68-82, 33 FR 18908, Dec. 18, 1968]

#### § 162.018-2 Scope.

(a) This specification covers requirements for the design, construction and testing of safety relief valves intended for use on unfired pressure vessels containing liquefied compressed gases installed on merchant vessels subject to inspection by the Coast Guard.

(b) [Reserved]

[CGFR 52-43, 17 FR 9540, Oct. 18, 1952]

#### § 162.018-3 Materials.

(a) The materials used in the manufacture of safety relief valves shall conform to the applicable requirements of subchapter F (Marine Engineering) of this chapter, except as otherwise specified in this subpart, and shall be resistant to the corrosive or other action of the liquefied compressed gas in the liquid or gas phase.

(b) All pressure containing external parts of valves must be constructed of materials melting above 1700 °F. for liquefied flammable gas service. Consideration of lower melting materials for internal pressure-containing parts will be given if their use provides significant improvement to the general operation of the valve. Flange gaskets shall be metal or spiral wound asbestos.

(c) Nonferrous materials shall not be used in the construction of valves for anhydrous ammonia or other service where susceptible to attack by the loading.

(d) The seats and disks shall be of suitable corrosion resistant material. Seats and disks of cast iron or malleable iron shall not be used. Springs

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shall be of best quality spring steel consistent with the design of the valve and the service requirement.

[CGFR 52-43, 17 FR 9540, Oct. 18, 1952, as amended by CGFR 68-82, 33 FR 18908, Dec. 18, 1968; CGD 72-206R, 38 FR 17230, June 29, 1973]

#### § 162.018-4 Construction and workmanship.

(a) Safety relief valves shall be of either the internal or external spring-loaded type, suitable for the intended service.

(b) Safety relief valve body, base, bonnet and internals shall be designed for a pressure of not less than the set-pressure of the valve.

(c) All safety relief valves shall be so constructed that the failure of any part cannot obstruct the free and full discharge of vapors from the valve.

(d) The nominal size of a safety relief valve shall be the inside diameter of the inlet opening to the individual valve disk. No safety relief valve shall be smaller than  $\frac{3}{4}$  inch nor larger than 6 inches. Safety relief valves shall have flanged or welded end inlet connections and either flanged or screwed outlet connections, except outlets exceeding 4 inches in diameter shall be flanged.

(e) Safety relief valves shall be of the angle or straight-through type, fitted with side or top outlet discharge connections.

(f)(1) Springs shall not show a permanent set exceeding 1 percent of their free length 10 minutes after being released from a cold compression test closing the spring solid.

(2) Springs may not be re-set for any pressure more than 10 percent above or 10 percent below that for which the valve is marked.

(3) If the operating conditions of a valve are changed so as to require a new spring under paragraph (f)(2) of this section for a different pressure, the valve shall be adjusted by the manufacturer or his authorized representative.

(g) The design and construction of safety relief valves shall permit easy access for inspection and repair.

(h) Safety relief valves shall be tapped for not less than  $\frac{1}{4}$  inch pipe size drain at the lowest practicable point where liquid can collect.

[CGFR 52-43, 17 FR 9540, Oct. 18, 1952]

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#### § 162.018-5 Blow-down adjustment and popping tolerance.

(a) Safety relief valves shall be so constructed that no shocks detrimental to the valve or pressure vessel are produced when lifting or closing. Safety relief valves shall be designed to open sharply and reach full lift and capacity at the maximum accumulation. Valve closure after popping shall be clean and sharp. Safety relief valves shall operate satisfactorily without wiredrawing and chattering at any stage of operation.

(b) Safety relief valves having adjustable blow-down construction shall be adjusted to close after blowing down not more than 5 percent of the set pressure. Valves shall be adjusted to pop within a tolerance of plus or minus 3 percent of the set pressure, except that for pressures of 70 p.s.i. and below, the tolerance in popping pressure shall not vary more than plus or minus 2 p.s.i.

[CGFR 52-43, 17 FR 9541, Oct. 18, 1952]

#### § 162.018-6 Marking.

(a) Each safety relief valve shall be plainly marked by the manufacturer with the required data in such a way that the marking will not be obliterated in service. The marking may be stamped on the valve or stamped or cast on a plate securely fastened to the valve. The marking shall include the following data:

(1) The name or identifying trademark of the manufacturer.

(2) Manufacturer's design or type number.

(3) Size \_\_\_\_ inches. (The pipe size of the valve inlet).

(4) Set pressure \_\_\_\_ p.s.i.

(5) Rated capacity \_\_\_\_ cubic feet per minute of the gas or vapor (at 60 °F. and 14.7 p.s.i.a.).

(6) Coast Guard approval number. The minimum wording for showing approval shall be "USCG 162.018/\* \*" or "USCG 162.018-\* \*".

(b) [Reserved]

[CGFR 68-82, 33 FR 18908, Dec. 18, 1968]

\* \* Number to be assigned by the Commandant.